CropWatch Bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

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CropWatch Online Resources: This bulletin along with additional resources is also available on the CropWatch Website at http://www.cropwatch.com.cn.

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Note: CropWatch resources, background materials and additional data are available online at www.cropwatch.com.cn.

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Abbreviations

5YA	Five-year average, the average for the four-month period for April-July from 2011 to 2015; one of the standard reference periods.
15YA	Fifteen-year average, the average for the four-month period from April-July from 2001 to 2015; one of the standard reference periods and typically referred to as "average."
BIOMSS	CropWatch agroclimatic indicator for biomass production potential
BOM	Australian Bureau of Meteorology
CALF	Cropped Arable Land Fraction
CAS	Chinese Academy of Sciences
CWAI	CropWatch Agroclimatic Indicator
CWSU	CropWatch Spatial Units
DM	Dry matter
EC/JRC	European Commission Joint Research Centre
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
GAUL	Global Administrative Units Layer
GVG	GPS, Video, and GIS data
ha	hectare
kcal	kilocalorie
MPZ	Major Production Zone
MRU	Monitoring and Reporting Unit
NDVI	Normalized Difference Vegetation Index
OCHA	UN Office for the Coordination of Humanitarian Affairs
OISST	Optimum Interpolation Sea Surface Temperature
PAR	Photosynthetically active radiation
PET	Potential Evapotranspiration
RADI	CAS Institute of Remote Sensing and Digital Earth
RADPAR	CropWatch PAR agroclimatic indicator
RAIN	CropWatch rainfall agroclimatic indicator
SOI	Southern Oscillation Index
TEMP	CropWatch air temperature agroclimatic indicator
Ton	Thousand kilograms
VCIx	CropWatch maximum Vegetation Condition Index
VHI	CropWatch Vegetation Health Index
VHIn	CropWatch minimum Vegetation Health Index
W/m^2	Watt per square meter

Bulletin overview and reporting period

This CropWatch bulletin presents a global overview of crop stage and condition between April 1 and July 31 2016—in this report referred to as the "April-July" period. It is the 102th bulletin produced by the CropWatch group at the Institute of Remote Sensing and Digital Earth (RADI) at the Chinese Academy of Sciences, Beijing.

CropWatch analyses are based mostly on several standard as well as new ground-based and remote sensing indicators, following a hierarchical approach. The analyses cover large global zones; major producing countries of maize, rice, wheat, and soybean; and detailed assessments of Chinese regions. In parallel to an increasing spatial precision of the analyses, indicators become more focused on agriculture as the analyses zoom in to smaller spatial units.

CropWatch uses two sets of indicators: (i) agroclimatic indicators—RAIN, TEMP, and RADPAR, which describe weather factors; and (ii) agronomic indicators—BIOMSS, VHIn, CALF, and VCIx, describing crop condition and development. The indicators RAIN, TEMP, RADPAR and BIOMSS do not directly describe the weather variables rain, temperature, radiation, or biomass, but rather they are spatial averages over agricultural areas, which are weighted according to the local crop production potential. For more details on the CropWatch indicators and spatial units used for the analysis, please see the quick reference guide in Annex C, as well as online resources and publications posted at www.cropwatch.com.cn.

This bulletin is organized as follows:

Chapter	Spatial coverage	Key indicators
Chapter 1	World, using Monitoring and Reporting Units (MRU), 65 large, agro-ecologically homogeneous units covering the globe	RAIN, TEMP, RADPAR, BIOMSS
Chapter 2	Major Production Zones (MPZ), six regions that contribute most to global food production	As above, plus CALF, VCIx, and VHIn
Chapter 3	30 key countries (main producers and exporters)	As above plus NDVI and GVG survey
Chapter 4	China	As above plus high resolution images
Chapter 5	Special topics: Production outlook, drought in Morocco, agriculture in Southwest Asia, and an update on El Niño.	
Online Resources	www.cropwatch.com.cn	

Newsletter and online resources

The bulletin is released quarterly in both English and Chinese. To sign up for the mailing list, please e-mail cropwatch@radi.ac.cn or visit CropWatch online at www.cropwatch.com.cn. Visit the CropWatch Website for additional resources and background materials about methodology, country agricultural profiles, and country long-term trends.

Executive summary

The current CropWatch bulletin is based mainly on remotely sensed data. It is prepared by a team at the Chinese Academy of Sciences (CAS) and focuses on crops that have already been harvested in 2016 as well as those that were growing between April and July, to be harvested later this year. The bulletin covers prevailing weather conditions, resulting crop condition, size of cultivated areas, and global food production, paying special attention to China and the thirty major agricultural countries. Together, they make up at least 80% of the production and exports of maize, rice, wheat, and soybean. The bulletin naturally has specific chapters about China and, starting with this bulletin, includes a section on Chinese trade and prices.

Global agroclimatic conditions

For this reporting period, a rather direct link exists between the performance of crops and some large scale (continental) patterns of agroclimatic anomalies, in particular abundant and sometimes excessive precipitation and drought.

Wet areas essentially include the following four:

- *"Sahel to Central Asia."* The largest positive rainfall anomalies occur in this area, generally implying a timely start of the rainy season from Mauritania to northern Sudan. Abundant rainfall also affected many areas where crop agriculture often plays a minor role in the economy compared to livestock and range-lands, including the Near-East and Central Asia up to Tajikistan, as well as parts of China (Xizang +102% and Xinjiang +186%). Much of the area had below average sunshine of -5% to -10%, with moderate temperature anomalies. Two countries, Ethiopia and Egypt, deserve specific mentioning. The first suffered severe drought conditions last year, while this season, of which the main crops are still to be harvested, underwent a slight rainfall deficit (-5%). According to satellite indices, however, cultivated land nevertheless increased over previous seasons (+5 percentage points) and no specific concerns exist about the agricultural season. In Egypt, almost all crops are irrigated, but CropWatch detected a 9 percentage point drop in summer crop area.
- *Eastern West Asia and South Asia.* Here, abundant rainfall in particular has affected India and Pakistan, leading to decreases in the fraction of cropped arable land of 12 and 8 percentage points respectively, compared to the recent averages. Both countries are characterized by marked spatial variability of crop condition in 2016.
- *Southeastern South America.* Large rainfall anomalies in South America occurred in important agricultural areas of Argentina and Uruguay, damaging summer crops and delaying planting but providing good soil moisture for winter crops, especially wheat.
- *Parts of North America.* In North America, wet conditions prevailed mainly from Texas to North Dakota and neighboring states.

Dry conditions affected some other areas in North America (including parts of the eastern Corn Belt), but mostly southern equatorial Brazil, where temperature and sunshine and the resulting crop water demand were mostly above average, resulting in a nationwide drop in cultivated land of 9 percentage points compared to average. Other drought affected countries include those in the western Mediterranean (Morocco, parts of Algeria, and Spain) and southern Africa. In eastern Asia, the driest region was centered on the Korean Peninsula and extended west as far as the Primorsky Krai in Russia.

2016 global crop production estimates

CropWatch currently estimates the production of 2016 to depart less than 1% from the production of 2015 for wheat (-0.1%), and soybean (+0.1%). For maize, a 1.3% increase is foreseen, while for rice a marked drop of -3.8% is expected mainly as a result of adverse conditions in India. The situation is slightly more favorable when the top five exporters are considered: Maize, wheat, and soybean supply are up by close to or more than 1% (or 0.8%, 2.0%, and 1.0%, respectively). For rice, the drop is 8%, which may result in some tension on international markets. Specific observations for each grain are as follows:

- *Maize.* CropWatch foresees large differences among the performances of national maize productions. The large drops affect South Africa (-32%), India (-13%), and Brazil (-12%). Positive departures worth mentioning include Kazakhstan (+5%) and Uzbekistan (+7%), Ukraine and neighboring Poland (9% and 7%, respectively), as well as Iran (+8%) and Ethiopia (+19%).
- *Rice.* Major rice producers from west to Southeast Asia suffered a production loss compared with the previous season, especially India (-13%), Vietnam (-8%), Thailand (-7%), Cambodia (-6%), Bangladesh (-5%), and Pakistan (-2%). Myanmar (+2%) and the United States (+4%) are worth mentioning among the producers of international relevance.
- *Wheat.* Largest decreases in wheat production are projected for Turkey (-16%) and India (-6%), as well as in Argentina and Brazil (-4% each). Large positive values among the major producers are those of Canada (+11%), Romania (+7%), and Australia (5%).
- *Soybean.* Due to changes in policy, China is forecast to increase production by 1%, the first inter-annual increase in more than a decade. Russia and Ukraine are both consolidating their role as significant soybean producers with respectively 3% and 2% production growths. Among the leading producers, Argentina is put at -1%, due to large excess precipitation, while Brazil and the United States are both estimated to increase their output over 2015, by 2% and 1%, respectively. Significant drops that may affect international markets include, again, India (-11%).

Altogether, CropWatch puts the Indian production deficits at about 1.5 million tons for soybean and respectively 2, 11, and 5 million tons for maize, rice, and wheat.

China crop production estimates

The current CropWatch estimates of 2016 cereal and soybean production in China are about 200 million tons for maize and rice (202.0 and 200.3), 118.6 million tons for wheat, and 13.1 million tons for soybeans. This is between 4% (soybean) and 28% (rice) of world production, with intermediate values for maize (20%) and wheat (16%). Compared with the previous year, this represents a production increase by 0.6% for maize (equivalent to 1.2 million tons) and for soybeans (equivalent to 127 thousand tons), while representing a drop of 1% for both wheat and rice, corresponding to absolute volumes of 1.1 million tons and 2.0 million tons, respectively. Projected import increases over 2015 are currently at 3.8% for maize, 36.1% for rice, 15.6% for wheat, and 6.4% for soybean.

At the regional and provincial scales, variations in production estimates result from a combination of environmental factors, policy changes, some long-term trends such as the conversion of double rice cropping to single rice cropping, as well as pests and diseases—the latter especially on winter wheat for the late stage of the growing season. Severe attacks of powdery mildew have been reported in the Loess region on more than a quarter of fields, as well as aphids on more than 20% of wheat in Huanghuaihai and Southwest China. Significant production variations include maize production in Hebei (+7%, both yield and area increased), Inner Mongolia (-8%, due to reduced planted area), Liaoning (+8%, a recovery from last year's severe drought), and Shandong (+6%, both yield and area increased). Rice production in Jilin, Liaoning, and Yunnan also present significant change (+12%, -10%, and 6%, respectively).